

Entering AP Calculus AB Summer Assignment

Welcome to AP Calculus AB!!! I am so excited to spend our year together continuing our journey through mathematics.

Directions.

- ♥ This assignment will be collected on the 1st day of classes. Exact Date TBD.
- ♥ Work must be organized and labeled. You may work on this document or you may use your own paper. Organized work is very important on the AP Exam given each May. Please take extra care to make sure that your work is easy to follow and your answers are easy to read.
- ♥ This assignment will be graded for accuracy and will count as 50% of your first major assessment for Quarter 1.
- ♥ During week 1 of the Fall semester you will be given an “in class” assessment based off the summer assignment. It will count as the remaining 50% of your 1st assessment.
- ♥ I do respond to email over the summer!!! If you every have a question or need a hint or two...please reach out.....I will respond in a timely manner.

I am really looking forward to working together next school year.....have a great summer.

Be safe and stay well.



Mrs. Weber

Summer Assignment

Polynomial Function Review

Describe the end behavior of each function.

1) $f(x) = -x^3 + 4x^2 - 4$

2) $f(x) = x^4 - 2x^2 - x + 1$

Divide. Write your answer in fraction form.

3) $(6x^4 - 11x^3 - 3x^2 + 12x - 25) \div (x - 2)$

4) $(2x^4 + 15x^3 + 21x^2 - 9x - 12) \div (2x + 1)$

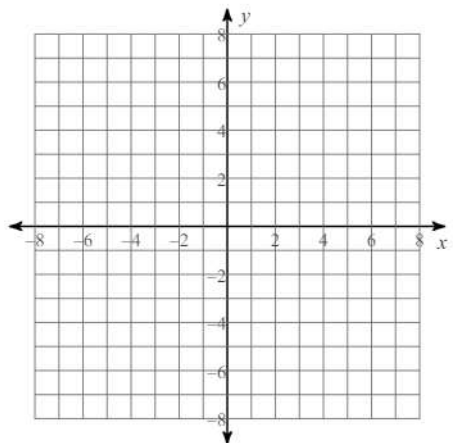
Find all zeros.

5) $f(x) = 3x^4 + 7x^3 + 5x^2 + x$

6) $f(x) = x^3 - 2x^2 - x + 2$

For each function: (1) determine the real zeros and state the multiplicity of any repeated zeros, (2) describe the end behavior, and (3) sketch the graph.

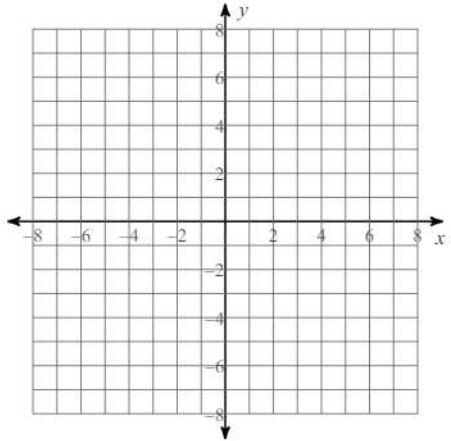
7) $f(x) = -x^4 - 7x^3 - 16x^2 - 12x$



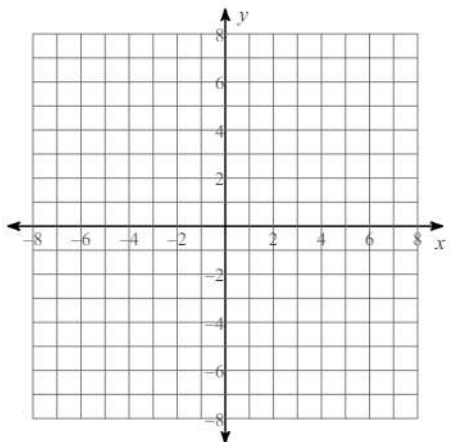
Rational Function Review

For each function, identify the holes, intercepts, horizontal asymptote, domain, limit behavior at all vertical asymptotes, and end behavior asymptote. Then sketch the graph.

$$8) f(x) = \frac{x^2 - x - 6}{x^2 + 3x}$$



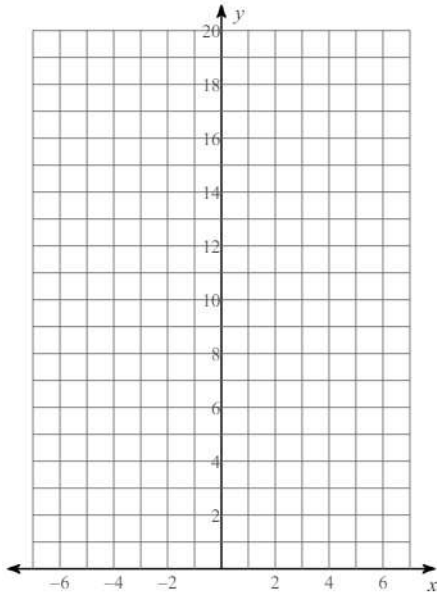
$$9) f(x) = -\frac{2x}{x^2 + 3x}$$



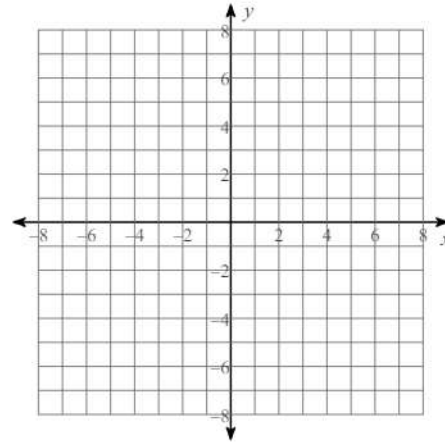
Exponential and Logarithmic Functions

Sketch the graph of each function.

10) $y = 3^{-x}$



11) $y = \ln(x - 1) + 3$



Solve each equation.

12) $-10e^{8x-3} - 4 = -38$

13) $3 \ln(3v + 6) - 10 = -1$

Expand each logarithm.

14) $\ln\left(\frac{a^2}{b}\right)^6$

15) $\ln(xy^2)^2$

Condense each expression to a single logarithm.

16) $6 \ln z + \frac{\ln x}{3}$

17) $18 \ln a - 6 \ln b$

- 18) What is the population of E. Coli in 7.2 minutes, if the current population is 172 million and E. Coli increases continuously at a rate of 1.9% per minute?
- 19) Bacteria in a culture grows continuously according to the law of exponential growth. If the population doubles in 20.4 minutes, in how many minutes will the population triple?
- 20) The half-life of Palladium-100 is 4 days . After 16 days an initial sample has been reduced to a mass of .75grams. Determine the starting mass.

Trigonometry Review:

Find the exact value of each expression

21) $\tan \frac{35\pi}{6}$

22) $\cos \frac{19\pi}{4}$

23) $\sin \frac{23\pi}{4}$

24) $\cot -\frac{9\pi}{2}$

25) $\sec \frac{7\pi}{3}$

26) $\csc \frac{\pi}{3}$

Solve for the exact value for $0 \leq \theta < 2\pi$.

27) $3\cot^2 \theta = 1$

28) $-3 + \cos^2 \theta - 2\cos \theta = -4$

29) $3\csc \theta = -1 - \cot \theta + 2\csc \theta$

30) $\cos \theta - \sin^2 \theta = -\cos^2 \theta$

31) $2 + 3\sin^2 \theta = 4\sin \theta + \cos^2 \theta$

32) $\cos 2\theta + 2\cos^2 \theta = 1$

33) $-\sin^2 2\theta = \sin^2 \theta - 2\sin^2 2\theta$

34) $-3\sin 2\theta + \cos \theta = -2\sin 2\theta$

Approximate the solutions in the interval $0 \leq \theta < 2\pi$.

35) $\cos 4x = \cos x + \cos 7x$

36) $\sin 5x = \cos 3x + \sin x$

Graph one period of each trig function. State the period and amplitude if applicable. Graph should be in radians.

37) $y = 2\cos 3\theta + 2$

38) $y = 2\sin 4\theta + 2$

39) $y = 4\tan 2\theta - 2$

40) $y = \frac{1}{2} \cdot \cot \theta + 1$

Solve each triangle. Round your answers to the nearest tenth.

41) $m\angle A = 120^\circ, m\angle C = 10^\circ, c = 7 \text{ km}$

42) $m\angle B = 86^\circ, a = 21 \text{ yd}, b = 15 \text{ yd}$

43) $m\angle A = 21^\circ, c = 6 \text{ cm}, a = 4 \text{ cm}$

44) $m\angle A = 104.5^\circ, b = 13.7 \text{ km}, c = 7.4 \text{ km}$

45) $a = 10 \text{ mi}, m\angle C = 116^\circ, b = 11 \text{ mi}$

46) $c = 21 \text{ ft}, a = 25 \text{ ft}, b = 22 \text{ ft}$

Find the exact value of each.

47) $\cos \theta = \frac{5}{13}$ where $\frac{3\pi}{2} \leq \theta < 2\pi$

Find $\cos 2\theta$

48) $\cos \theta = -\frac{3}{5}$ where $\pi \leq \theta < \frac{3\pi}{2}$

Find $\cos 2\theta$

49) $\tan \theta = \frac{3}{5}$ where $\pi \leq \theta < \frac{3\pi}{2}$

Find $\sin \frac{\theta}{2}$

50) $\tan \theta = -\frac{12}{5}$ where $\frac{\pi}{2} \leq \theta < \pi$

Find $\sin \frac{\theta}{2}$